Contains Confidential Business Information **FOIA Exempt B Do Not Release**

United States Environmental Protection Agency

Region 5
Air and Radiation Division
77 West Jackson Boulevard
Chicago, IL 60604-3590

DATE:

SUBJECT: Announced Inspection of Citgo Petroleum Corporation
Lemont, Illinois

FROM: Constantinos Loukeris, Environmental Engineer
Enforcement and Compliance Assurance Section (MI/WI)

THRU: Sara Breneman, Chief SB
Enforcement and Compliance Assurance Section (MI/WI)

TO: File

Facility:	Citgo Petroleum Corporation
Location:	135th Street and New Avenue Lemont, Illinois
Inspection Date:	July 12-15, 2010
Inspection Team:	Virginia Palmer, U.S. EPA Region 5 Constantinos Loukeris, U.S. EPA Region 5 Molly DeSalle, U.S. EPA Region 5 James Zimny, U.S. EPA Region 5 Armando Bustamante, U.S. EPA NEIC Alex Weir, U.S. EPA NEIC
Facility Attendees:	Claude W. Harmon, Manager – Health, Safety, Security, and Environmental Tracy L. Short, Environmental Field Coordinator Richard E. Olson, Manager - Environmental

Overview of Company:

Citgo Petroleum Corporation (Citgo) is a refiner and marketer of transportation fuels, lubricants, petrochemicals, and other industrial products. Based out of Houston, Texas, Citgo has the

capacity to refine more than 749,000 barrels of crude oil per day. Citgo operates a refinery in Lemont, Illinois that typically refines 165,000 barrels of crude oil per day.

Citgo operates 24 hours a day for 7 days a week.

Arrival to Facility and Opening Conference:

Prior to arrival at the facility, Constantinos Loukeris contacted Claude Harmon of Citgo on July 9, 2010 to announce that an inspection was to take place the week of July 12, 2010. Mr. Loukeris stated that the primary focus of the inspection was Leak Detection and Repair (LDAR) as it applies to the refinery and that 3 Toxic Vapor Analyzer (TVA) 1000Bs would be brought on-site by EPA to conduct EPA Reference Method 21. Mr. Loukeris highlighted the need for the LDAR contractor to be available to confirm any leaks identified by U.S. EPA during the inspection. He also asked that a copy of the LDAR database be prepared for EPA to take at the end of the inspection.

Virginia Palmer, Constantinos Loukeris, Molly DeSalle and James Zimny of EPA Region 5 and Armando Bustamante and Alex Weir of EPA's National Enforcement Investigation Center (NEIC) ['we'] arrived at the facility at approximately 1:30 pm on July 12, 2010. After presenting our credentials to security, we met Claude W. Harmon, HSSE Manager, and Tracy Short, Environmental Field Coordinator for Citgo. After we received our visitor passes, we were escorted to a conference room for the opening conference.

Before the opening conference we watched a safety video. We stated that the focus of our inspection would be the processes subject to the Consent Decree entered in 2005. The provisions of this subpart apply to pumps and valves. Mr. Short told us that Encompas was the LDAR contractor since December 1, 2009. Furmanite was the previous LDAR contractor.

Process Overview:

Exemption 4-Confidential Business Information [redacted]

Citgo highlighted that the process unit subject to the National Emission Standard for Hazardous Air Pollutant from Synthetic Organic Chemical Manufacturing Industry (HON) at 40 C.F.R. Part 63, Subparts F, G, and H are considered to be part of the 2005 Consent Decree.

LDAR Monitoring Records and Procedures:

After the process overview we turned the conversation to the LDAR program. Citgo provided a

printout of consent decree monitoring and leak rates by process unit for the period of January 1, 2010 through July 12, 2010. Upon review, we determined that we would start monitoring at the Sat Gas Plant, CRU #1, and the UDEX process units.

LDAR Monitoring:

Attachment 1 contains the monitoring results from the Sat Gas Plant unit. Attachment 2 contains the monitoring results from the CRU-1 unit. Attachment 3 contains the monitoring results from the UDEX unit. Attachment 4 contains the monitoring results from the Blend Center unit. Attachment 5 shows the results of the daily calibrations.

LDAR Monitoring: July 12, 2010:

We started the day by calibrating our TVA-1000Bs at the Citgo Lemont facility. The calibration is performed at the following concentrations: a zero gas, 500 ppm, 2,000 ppm, and 10,000 ppm. Monitoring on this day took place only in the Sat Gas Plant. Tables A and B identify the leaks over 500 ppm and over 200 ppm identified during the EPA Method 21 monitoring, respectively.

Table A. Leaks Over 500 ppm Identified at the Sat Gas Plant on July 12, 2010

Component ID	Component Type	U.S. EPA TVA Reading (ppm)	Encompas TVA Reading (ppm)	Notes
LL01108	Valve	380	516	Component placed on DOR on 7/23/08
LL01016	Valve	618	-	Component placed on DOR on 7/12/07
LL00194	Valve	3,100	3,800	-
LL00008	Pump	5,500	1,600	-
GV00381	Valve	450	815	-
LL00157	Valve	285	666	-
LL00511	Valve	750	1,170	-
LL01137	Valve	510	536	Component placed on DOR on 7/11/07
LL01136	Valve	576	680	Component placed on DOR 12/27/06

Table B. Leaks Over 200 ppm Identified at the Sat Gas Plant on July 12, 2010

Component ID	Component Type	U.S. EPA TVA Reading (ppm)	Encompas TVA Reading (ppm)	Notes
LL00766	Valve	245	-	Component placed on DOR on 7/23/08
LL01068	Valve	400	250	-
LL01075	Valve	295	-	Component placed on DOR on 10/4/07
LL00148	Valve	394	435	-
LL00128	Valve	286	378	-

We finished monitoring around 4:40 pm. We had a close-out conference with the facility representatives where we confirmed the valves that we found leaking over 500 ppm.

LDAR Monitoring: July 13, 2010:

Monitoring on this day took place in the CRU-1 and UDEX units. Tables C, D, E, and F identify the leaks over 500 ppm and over 200 ppm identified during the EPA Method 21 monitoring.

Table C. Leaks Over 500 ppm at the CRU-1 Identified on July 13, 2010

Component ID	Component Type	U.S. EPA TVA Reading (ppm)	Encompas TVA Reading (ppm)	Notes
GV00129	Valve	730	955	-
GV00765	Valve	10,100	9,060	-
GV00425	Connector	31,000	21,500	-
GV00683	Connector	595	696	-
LL00014	Pump	3,200	6,897	Component already tagged on 6/23/10
LL00026	Valve	905	1,227	-
LL00039	Valve	524	610	-
LL00097	Valve	521	403	-
LL00298	Plug	3,000	5,374	-
LL00479	Valve	610	1,050	-
LL00533	Valve	890	924	-

LL00771	Valve	550	824	-
LL00796	Valve	950	1,288	-
GV00451	Valve	520	718	-
LL00299	Plug	30,000	100,000	-

Table D. Leaks Over 200 ppm at the CRU-1 Identified on July 13, 2010

Component ID	Component Type	U.S. EPA TVA Reading (ppm)	Encompas TVA Reading (ppm)	Notes
GV00003	Valve	325	270	-
GV00130	Valve	230	375	175 ppm after initial attempt at repair
GV00181	Valve	318	257	-
GV00303	Valve	450	467	-
GV00683??	Valve?	310	384	Visual Leak
GV00762	Valve	340	391	-
GV00892	Valve	325	411	-
LL00041	Valve	348	252	-
LL00098	Valve	231	147	-
LL00603	Valve	360	103	-
LL00642	Valve	206	225	-
LL00664	Valve	205	258	445 ppm after initial attempt at repair
LL00666	Valve	380	402	263 ppm after initial attempt at repair
LL00744	Valve	360	397	-
LL00746	Valve	338	322	-
LL00821	Valve	410	374	-
LL00829	Valve	320	422	-
LL00856	Valve	350	402	-
LL00891	Valve	390	287	-
LL01436	Valve	291	174	-

Table E. Leaks Over 500 ppm at the UDEX unit Identified on July 13, 2010

Component ID	Component Type	EPA TVA Reading (ppm)	Encompas TVA Reading (ppm)	Notes
GV00394	Valve	2,900	-	Component placed on DOR on 7/26/07
GV00395	Valve	30,000	-	Component placed on DOR on 10/11/07
GV00837	Valve	800	793	-
LL01906	Valve	561	622	-
LL01914	Valve	880	1,025	-

Table F. Leaks Over 200 ppm at the UDEX unit Identified on July 13, 2010

Component ID	Component Type	U.S. EPA TVA Reading (ppm)	Encompas TVA Reading (ppm)	Notes
GV00386	Valve	370	293	-
LL02251	Valve	415	467	-
LL02863	Valve	390	393	-

We finished monitoring around 3:30 pm. We had a close-out conference with the facility representatives where we confirmed the valves that we found leaking over 500 ppm. We stated that monitoring on July 14, 2010 would be in the UDEX Unit.

LDAR Monitoring: July 14, 2010:

Monitoring on this day took place only in the UDEX unit. Tables G and H identify the leaks over 500 ppm and over 200 ppm identified during the EPA Method 21 monitoring.

Table G. Leak Over 500 ppm Identified at the UDEX unit on July 14, 2010

Component ID	Component Type	U.S. EPA TVA Reading (ppm)	Encompas TVA Reading (ppm)	Notes
GV00523	Valve	3,170	3,166	-
GV00556	Valve	936	800	-
LL00016	Pump	2,500	2,920	Repair tag indicated repair to 580 ppm on 7/8/10
LL00055	Pump	5,600	7,219	Component placed on DOR on 6/24/10

LL00141	Valve	2,550	3,020	1,792 after initial attempt at repair
LL00860	Valve	970	1,245	Component placed on DOR on 7/2/08
LL00900	Valve	409	490	2,336 ppm after initial attempt at repair
LL00911	Valve	530	564	915 ppm after initial attempt at repair
LL00916	Valve	830	22,500	71,000 after initial repair attempt
LL00960	Valve	360	32,400	Component placed on DOR on 5/30/08
LL00974	Valve	6,500	43,900	Repair tag indicated repair on 7/10/10 was unsuccessful
LL00998	Valve	980	707	697 ppm after initial attempt at repair
LL01021	Valve	22,000	49,400	Component placed on DOR on 7/25/07
LL01029	Valve	600	530	-
LL01030	Valve	590	617	-
LL01031	Valve	3,930	5,151	-
LL01105	Valve	657	771	Repair tag indicated repair to 448 ppm on 7/10/10
LL02582	Valve	6,300	3,618	-
LL02908	Valve	680	817	-
LL02917	Valve	2,300	1,857	-
LL03375	Valve	670	673	-
LL03386	Valve	2,309	1,487	-
LL03463	Valve	729	607	-
LL03471	Valve	366	1,009	Component placed on DOR on 8/2/06
LL03473	Valve	505	634	Component placed on DOR on 8/6/07
LL03480	Valve	745	752	Component placed on DOR on 7/11/07

LL03596	Valve	907	2,416	-

Table H. Leaks Over 200 ppm Identified at the UDEX unit on July 14, 2010

Component ID	Component Type	U.S. EPA TVA Reading (ppm)	Encompas TVA Reading (ppm)	Notes
GV00514	Valve	386	433	-
GV00531	Valve	328	451	-
GV00532	Valve	340	386	-
LL00432	Valve	380	416	-
LL00873	Valve	230	186	-
LL00901	Valve	220	185	-
LL00915	Valve	216	237	450 ppm after initial attempt at repair
LL00921	Valve	418	427	240 ppm after initial attempt at repair
LL00949	Valve	240	227	Repair tag indicated repair to 407 ppm made on 7/10/10
LL00978	Valve	409	476	-
LL01020	Valve	400	151	-
LL01367	Valve	240	180	-
LL01625	Valve	360	301	-
LL02323	Valve	380	269	-
LL02924	Valve	380	255	-
LL03013	Valve	375	218	-
LL03257	Valve	350	342	-
LL03440	Valve	368	372	-
LL03464	Valve	384	485	-

We left for the day at approximately 4:30 pm.

LDAR Monitoring: July 15, 2010:

Monitoring on this day took place only in the Blend Center unit. Tables I and J identify the leaks over 500 ppm and over 200 ppm identified during the EPA Method 21 monitoring.

Table I. Leaks Over 500 ppm Identified at the Blend Center unit on July 15, 2010

Component ID	Component Type	U.S. EPA TVA Reading (ppm)	Encompas TVA Reading (ppm)	Notes
LL00087	Valve	750	780	599 ppm after initial attempt at repair
LL00134	Valve	510	663	-
LL00554	Plug	718	22,000	-
LL00610	Valve	940	818	-
LL00672	Pump	22,500	100,000	-
LL00686	Plug	4,150	87,800	-
LL00721	Valve	480	528	627 ppm after initial attempt at repair
LL00741	Valve	519	437	-

Table J. Leaks Over 200 ppm Identified at the Blend Center unit on July 15, 2010

Component ID	Component Type	U.S. EPA TVA Reading (ppm)	Encompas TVA Reading (ppm)	Notes
LL00040	Valve	380	402	-
LL00668	Valve	367	401	-
LL00763	Valve	460	442	17 ppm after intial attempt at repair
LL00854	Valve	336	477	-
LL00990	Valve	320	303	150 ppm after initial attempt at repair

EPA conducted a FLIR® infrared (IR) camera survey of the facility's flare to evaluate proper combustion. EPA recorded 3 IR videos: 2 of the C-1 flare and 1 of the C-3 flare. In the video of the C-3 flare, there is a hydrocarbon plume trailing the flare. In the videos of the C-1 flare, there is a feint hydrocarbon plume trailing the flare. The videos were recorded using Citgo's portable video recorder, thus, Citgo provided the video clips via compact disk on August 6, 2010.

We left for the day at approximately 4:30 pm.

EPA Monitoring Summary for July 12-15, 2010:

Table K: EPA Valve Monitoring Summary

Unit	Number of Components Monitored	Number of Leaks Over 500 ppm Identified	Leak Rate (%)
Sat Gas Plant	558	8	1.43
CRU-1	761	9	1.18
UDEX	1,064	29	2.73
Blend Center	438	6	1.37

Table L: Citgo Consent Decree Leak Rate (Valves @ 500 ppm)

Unit	Leak Rate 1st Q 2010 (%)	Leak Rate 2nd Q 2010 (%)	Average
Sat Gas Plant	0.45	1.1	0.78
CRU-1	1.47	0.42	0.94
UDEX	0.49	0.75	0.62
Blend Center	0.47	0.28	0.38

Closing Conference: July 15, 2010:

We started the closing conference 2:20 pm. During the conference, we pointed out some areas of concern that we found during the inspection, including a significant difference in leak rates found from the monitoring done by EPA versus the historical leak rate of those process units.

We stated that no compliance determinations are done on-site; the records we retrieved, along with any additional records we may request through a Section 114 letter, will be reviewed to determine compliance status.

Records Retrieved (via compact disk on August 6, 2010):

1. LDAR Audit Report 2005
2. LDAR Audit Report 2007
3. LDAR Audit Report 2009
4. Semi-Annual Report – 2009: 2nd Half, HON and RMACT
5. Semi-Annual Report – 2009: 1st Half, HON and RMACT
6. Semi-Annual Report – 2008: 2nd Half, HON and RMACT
7. Semi-Annual Report – 2008: 1st Half, HON and RMACT
8. Unit 122 Shutdowns (Claimed Confidential Business Information)
9. FLIR® IR Video of the C-1 flare stack
10. Back-up of the LDAR database
11. Compliance Monitoring Summary: January 1, 2010 through July 12, 2010